

REMARKS

Claims 1-11, 13-23 and 27-56 currently are pending in the application. Applicants have amended the claims herein, including cancellation of claims 53-55, and submit that the objections to the claims noted on page 2, paragraph 4, of the Office Action therefore are obviated.

The Office has noted that English translations of German priority documents have not been filed. Applicants are submitting an English translation of German priority application DE 199 07 080.6, filed February 19, 1999, with the present response.

Applicants acknowledge withdrawal of the previous objections to the specification, abstract and claims and the previous rejection of claims under 35 U.S.C. § 112, second paragraph.

Claim 47 is rejected under 35 U.S.C. §112, second paragraph as lacking antecedent basis for the phrase "said semiconducting material." This claim is amended to correct the indefiniteness pointed out by the Office and now depends from claim 1. The amendment is supported by original claim 9 of the specification as filed, which referred to the carrier having a surface selected from semiconducting materials, for example silicon, germanium or gallium arsenide. Applicants request reconsideration of this claim and withdrawal of the rejection.

Claims 1-23 and 27-52 and 56 remain rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,271,957 to Quate et al. With respect to independent claim 27, the rejection is based on teachings in Quate with respect to UV light. The Office Action (page 7, lines 6-12) notes that the Quate patent is prior art against the application under examination here because Applicants have not filed an English-language translation of the German priority document. Applicants repeat the previously

submitted arguments concerning the teachings and fair suggestions of Quate. Claim 27 recites a UV light source array. Quate et al. does not even hint at this feature of claim 27, and in particular does not teach or suggest this UV light source array in the priority provisional application.

Applicants are submitting an English-language translation of German priority document, application no. 199 07 080.6, filed February 19, 1999. Applicants are entitled to a priority date of at least February 19, 1999, which antedates the Quate patent. The Quate patent, filed May 26, 1999, claims priority to a U.S. provisional application filed May 29, 1998, however this earlier-filed document does not contain the disclosures of the issued patent with respect to using UV illumination. The Quate provisional application discloses methods using 436 nm light, and teaches away from using UV illumination with available technology at page 8, lines 12-13 and page 9, lines 5-6.

Applicants therefore submit that the Quate patent is not entitled to the provisional filing date with respect to the subject matter of UV illumination methods. The present German priority document filed herewith, however contains a disclosure of this subject matter in the paragraph bridging pages 9-10 and at page 19 of the translation. Applicants have submitted herewith a copy of the Quate provisional application in an Information Disclosure Statement for the convenience of the Office and request its consideration. Applicants submit that this application is entitled to a priority date of at least February 19, 1999 for this subject matter therefore have overcome the rejection of claim 27 and all claims dependent on claim 27 based on Quate and request its withdrawal.

With respect to claims 1-23 and 46-52, the rejection is based on the assertion that the Quate patent discloses polymer array synthesis without masks using a spatial light modulation,

including micromirror arrays, to generate illumination patterns on the substrate and that the micromirror array can be programmed. The Office Action specifically characterizes the Quate disclosures as teaching that the computer specifies which of the micromirrors in the array should be on or off to generate the desired pattern of light. Quate, however, does not discuss, teach, or even suggest a step of detecting the illumination pattern using a light sensor matrix. Any detection performed by Quate is done, not during synthesis of the array, but to detect fluorescence (binding of a labeled ligand) during use of the already-manufactured array in an assay. Therefore this detection does not even relate to the method of coating a biochip carrier. Applicants submit that the Quate "detection" is not equivalent to the method of coating a biochip carrier with monitoring (detecting) of the illumination pattern during synthesis using a light sensor matrix. At no point does the Quate reference, or the Winkler patent which is incorporated into Quate (U.S. Patent No. 6,136,269) describe using a light sensor matrix to detect the illumination of the carrier during synthesis to monitor the synthetic process or to determine whether the illumination is falling on the correct location(s) on the carrier.

The claims of this application have been amended to clarify the control and monitoring aspects of the invention. Claim 1 is amended to add language concerning providing an illumination matrix and a detector and a new step (c) which recites a detecting step using a light sensor matrix. Applicants submit that this feature is not disclosed or even suggested in the cited art, and that the anticipation rejection of the claims over Quate therefore should be withdrawn. The Office Action refers to Quate as teaching a "light sensor matrix," this matrix is not used during array synthesis and nothing in the reference suggests the

method claimed here. Applicants now request withdrawal of the rejection of claims 1-23 and 46-52 over Quate.

Claims 1-23 and 27 are rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,375,903 to Cerrina et al. The basis for this rejection is the assertion that the Cerrina reference discloses synthesis of an active surface on a substrate using a high precision two-dimensional light image projection by micro-mirrors. The mirrors are individually addressed with the aid of a controlling computer that causes the appropriate micro-mirror to assume a "reflect" or "deflect" position.

As discussed above for Quate, this reference also does not disclose or even suggest a light sensor matrix detector or any detector to detect the illumination pattern produced by the mirrors during the process of producing an array on the substrate. The computer of Cerrina receives no input related to the micro-mirror-produced illumination and so does not detect or monitor the locations being illuminated. Therefore the illumination matrix is not controlled and monitored as is the invention intended to be claimed here. Further, there is no suggestion in the reference that this type of monitoring would be advantageous and therefore no motivation to modify the Cerrina teachings.

The Cerrina reference discloses only a computer which turns the mirrors of the micro-mirror array to an on-or-off position and a means for detection of fluorescence when the already-synthesized biochip array is used in an assay. Applicants submit that this does not teach or even suggest an array synthesis method with detection of the illumination pattern used for synthesis. For these reasons, Applicants submit that the Cerrina reference does not teach or suggest the step of detecting the illumination pattern using a light source matrix and optionally

adjusting said illumination pattern as claimed. Therefore, Applicants submit that the reference lacks at least one claim element of claim 1 and of claims 28 and 56, for example a light sensor array for detection.

With respect to claim 27, the Office asserts that the Cerrina reference discloses a UV source which reads on the UV sources of claim 27. Applicants respectfully traverse this rejection. Cerrina teaches a UV lamp, but does not teach or suggest a UV light source array. The recitations of claim 27 relate to an array of UV sources and not to a single UV lamp. The claim has been amended to clarify this aspect of the invention and to recite a UV light source array. Prior to amendment, claim 27 recited a UV source selected from a diode array, a laser array or both. The claim has been amended herein to clarify this aspect and now specifically recites in step (a) UV light source array. Applicants submit that Cerrina does not teach or even suggest such an array, and therefore cannot anticipate the invention of these claims. Applicants therefore request that the rejection of the claims over Cerrina be withdrawn.

The claim amendments made herein are fully supported by the specification as filed and contain no new matter. Claim 1 is amended, as suggested by the examiner, to recite that an illumination matrix and light sensor matrix detector are provided. Language reciting the illumination and light sensor matrices was moved from step (b) of the claim and therefore is not new. In addition, Applicants would like to point to the text beginning at page 8, second paragraph for a discussion of illumination matrices, including those using micromechanical mirror arrays or light source arrays, including UV light-emitting diode arrays and UV laser arrays. See also page 11, lines 15-35,

which discusses "matrix-like arrangements of very small light sources which can be controlled individually." Monitoring of the carrier exposure by the light sensor matrix is discussed at page 17, lines 34-36.

Claim 1 also incorporates a new step (c) which relates to detecting the illumination pattern and optionally adjusting the pattern. Monitoring the light exposure using a light sensor matrix and controlling the light exposure taking into account the information from the light sensor matrix is disclosed in the specification at page 17, lines 34-38.

Claim 6 is amended to depend from claim 5 rather than claim 1 to provide antecedent basis for the term "said reflector matrix." Claims 19-20 and 53-55 are canceled.

Claims 27 and 56 are amended analogously to claim 1 in step (b). The language added to claim 56 is taken from claim 1 and from dependent claims and therefore is supported for the same reasons as claim 1, and by the original claims. The language added to step (a) of claim 27 is supported by the original specification, for example at page 11, lines 15-35.

Claim 28 is amended as necessitated by the amendments to claim 27, from which it depends, so that the language corresponds and antecedent basis is retained. New claim 57 is added to claim a specific embodiment deleted from claim 27 herein.

Claims 1-23 and 27 are provisionally rejected for non-statutory double patenting over claims 1-36 of application serial no. 09/763,914 and claims 1-38 of application serial no. 10/727,566. Because none of the affected claims have been indicated to be allowable at this time, it is not clear whether any conflicting claims would be patented. Applicants would be willing to file a terminal disclaimer, however, should claims

which conflict with the claims here be found otherwise allowable in the cited applications.

Applicants request that the Office reconsider the claims presented here in light of the above submission and permit the application to proceed to allowance at this time. Should any issues remain outstanding, the Examiner is invited to telephone the undersigned.

RESPECTFULLY SUBMITTED,					
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